

Association for Information Systems AIS Electronic Library (AISeL)

PACIS 2013 Proceedings

Pacific Asia Conference on Information Systems
(PACIS)

6-18-2013

Governance of IT Service Procurement: Relationship vs Network based Approach

Jaeyoun Oh

Brunel University, jaeyoun.oh@brunel.ac.uk

Habin Lee

Brunel University, habin.lee@brunel.ac.uk

Aggeliki Tsohou

Brunel University, aggeliki.tsohou@brunel.acu.uk

Follow this and additional works at: <http://aisel.aisnet.org/pacis2013>

Recommended Citation

Oh, Jaeyoun; Lee, Habin; and Tsohou, Aggeliki, "Governance of IT Service Procurement: Relationship vs Network based Approach" (2013). *PACIS 2013 Proceedings*. 55.

<http://aisel.aisnet.org/pacis2013/55>

This material is brought to you by the Pacific Asia Conference on Information Systems (PACIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in PACIS 2013 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

GOVERNANCE OF IT SERVICE PROCUREMENT: RELATIONSHIP VS NETWORK BASED APPROACH

Jaeyoun Oh, Brunel Business School, Brunel University, London, United Kingdom,
jaeyoun.oh@brunel.ac.uk

Habin Lee, Brunel Business School, Brunel University, London, United Kingdom,
habin.lee@brunel.ac.uk

Aggeliki Tsohou, Brunel Business School, Brunel University, London, United Kingdom,
aggeliki.tsohou@brunel.acu.uk

Abstract

Relational and structural embeddedness are reported to play an important role in the context of information technology outsourcing (ITO). However, we do not fully understand which of the two types of embeddedness is more appropriate in preventing opportunistic behaviour and improving long-term performance in the presence of uncertainty which is not uniform across a wide range of outsourced IT services and products. In order to address this question, a virtual ITO network is simulated where firms take the partner selection and control strategy based on relational or structural embeddedness. They also compete with each other to maximise their long-term profits. The simulation results show that the advantage of each type of embeddedness is different according to the levels of measurement difficulty and requirement unpredictability which coexist in the ITO business environments. Therefore, this study provides a better understanding of the conditional superiority of each type of embeddedness in the presence of the two uncertainties and offers ITO managers with a guideline for a choice between relational and structural embeddedness.

Keywords: Relational and structural embeddedness, Opportunistic behaviour, IT outsourcing.

1 INTRODUCTION

Opportunistic behaviour causes undesirable outcomes including cost escalation and service debasement in information technology outsourcing (ITO) and how to mitigate opportunism is one of the critical issues in ITO literature (Aubert et al. 1998). Recently, relational and structural embeddedness are reported to play an important role in the context of ITO (Poppo & Zenger 2002; Ravindran et al. 2009). However, we do not fully understand which of the two types of embeddedness is more suitable in safeguarding against opportunism and enhancing long-term performance in the presence of uncertainty which is not uniform across a wide range of outsourced IT services and products. The paper reveals the conditional superiority of each type of embeddedness at the different levels of the following two uncertainties imposed on the ITO business environments: the unpredictability of IT service requirements and the difficulty in measuring ITO performance.

Relational embeddedness is defined as “the kind of personal relationships people have developed with each other through a history of interactions” while structural embeddedness as “the impersonal configuration of linkages between people or units” (Nahapiet & Ghoshal 1998, p.244). Once a business opportunity is created in an ITO network, a firm can exchange with a partner (believed to be trustworthy) among existing parties with whom it has the outsourcing histories in the perspective of relational embeddedness. Alternatively, from the viewpoint of structural embeddedness, a firm can collect information on multiple alternative candidates through the observation of their network linkages although it has no outsourcing histories with them. Also, based on this information, it can transact with a new partner who could make better performance. However, the building and maintenance of new relationships require resources which might be better used for improving outcomes through the refinement of existing relationships. Therefore, a firm in an ITO network faces a choice between relational and structural embeddedness.

Relational exchange theory can theoretically support the research on the partner selection and control strategy based on relational embeddedness, which is called “the relational strategy” in this research. Trust, commitment and reciprocity are manifested and developed in the process of the repetition or long-term maintenance of a transaction relationship between specific outsourcing parties in the perspective of relational exchange (Poppo & Zenger 2002). Then, these relational elements can contribute to the safeguard against opportunistic behaviour (Brown et al. 2004). Furthermore, a client can reduce the considerable transaction costs involved in finding and managing a new vendor by repeating or sustaining its current ITO relationship (Gopal et al. 2003). Social capital theory can provide the theoretical foundations of studies on the partner choice and management strategy based on structural embeddedness, which is called “the structural strategy” in this study. A network is a source of information on past exchanges and acts as a “prism” through which this information is provided for third parties (Ravindran et al. 2009). A firm can therefore gain information on the reliability and competence of multiple alternative candidates through the observation of their network linkages to connote this information (Gulati 1995). Then, it can enhance performance by selecting a partner who is considered more suitable for a given outsourcing opportunity because diverse experts could provide more potential profits than fixed partners (Kandori 1992). Furthermore, the selected partner who is perceived to be reliable would refrain from behaving opportunistically to prevent the loss of its reputation.

However, each ITO research stream on relational or structural embeddedness has mainly focused on its own advantages in safeguarding against opportunism and improving long-term performance in response to several critical risks. That is, the conditional superiority of each type of embeddedness has not been investigated in the ITO business environments. This one-sided emphasis may lead to the puzzling conclusion that both types of embeddedness could be universally optimal for any given risk. What is worse, an improper prescription derived from this confusing conclusion may be given to a firm facing a choice between relational and structural embeddedness. Furthermore, although the two types of embeddedness have been compared in other research contexts, the main research focus has been on which of them is preferred rather than which of them leads better performance (Podolny 1994;

Gulati 1995; DiMaggio & Louch 1998; Beckman et al. 2004). Therefore, this paper attempts to answer the following question in the context of ITO.

- Which of the two types of embeddedness is more appropriate in preventing opportunism and improving long-term performance in the presence of risks imposed on the ITO business environments?

In particular, this paper introduces the following two uncertainties as a comparative criterion: the unpredictability of IT service requirements and the difficulty in measuring ITO performance. It is widely accepted that these uncertainties drawn from transaction cost theory and agency theory tend to increase the possibility of opportunism and threaten long-term performance in the context of ITO (Aubert et al. 1998; Lacity et al. 2010; Kim and Chung 2003). Therefore, the different levels of measurement difficulty and requirement unpredictability can create an ideal environment for investigating the conditional superiority of relational or structural embeddedness in preventing ITO partner's opportunistic behaviour and improving long-term ITO outcomes.

This paper adopts a simulation and game theoretic approach to obtain answers to the research question. A simulation approach is useful for dealing with the research question because it can appropriately demonstrate the behaviour of actors who compose a network and affect one another through their interactions, and the performance which is the consequence of their behaviour. In addition, it is especially proper in case of challenging to gain sufficient empirical data sets at the different levels of measurement difficulty and requirement unpredictability in the long term. In this case, this approach can be an effective substitute for an empirical approach. A game-theoretic approach is widely adopted in organisational studies. Especially, the game models developed by Shapiro and Stiglitz (1984) and Kandori (1992) are suitable for this research. Therefore, a modified game model based on a mixture of the two studies can analytically reveal the decision-making and resulting outcomes of firms in an ITO network where repeated or non-repeated interactions occur. In the meantime, a full factorial design is applied for efficient experiments and systematic analyses.

This paper is organised as follows. The next section provides the theoretical background of this research. The simulation model is illustrated in the following section. Finally, we discuss the findings and contributions.

2 THEORETICAL BACKGROUND

2.1 Risk Factors and Opportunistic Behaviour

Opportunistic behaviour leads to negative outcomes in ITO business environments. Therefore, a lot of effort has been devoted to identify risk factors which can cause this behaviour and threaten performance. Among many risk factors drawn from transaction cost theory and agency theory, uncertainty and measurement difficulty are frequently and significantly examined in ITO studies (Lacity et al. 2010). The research of Robertson and Gatignon (1998) provides a well-organised classification for uncertainty in the context of R&D alliances. That is, uncertainty is categorised into two dimensions: external and internal uncertainty. Also, external uncertainty includes demand and technological uncertainty while internal uncertainty involves the difficulty in measuring performance and the lack of experience with alliances. Furthermore, it is suggested that three areas of uncertainty are intensively studied in the context of ITO: technological, measurement and demand uncertainty (Kim & Chung 2003). Based on these classifications, this research adopts the unpredictability of IT service requirements which is external to ITO relationships and the difficulty in measuring ITO performance which is internal to ITO relationships.

2.2 Relational and Structural Embeddedness

It has been shown that relational and structural embeddedness can play a significant role in controlling requirement unpredictability and measurement difficulty in the context of ITO (Poppo & Zenger 2002; Ravindran et al. 2009). The roles of each type of embeddedness can be explained mainly based on relational exchange theory and social capital theory. Scholars supporting relational exchange

theory argue that relational exchange is distinguished from discrete exchange. Discrete exchange is regarded as a one-time interaction between anonymous parties, who mainly focuses on the maximisation of their own short-term economic efficiency (Ring & Van de Ven 1992). Therefore, the identities and relational aspects between them are likely to be ignored in this exchange (Kim & Chung 2003). On the other hand, relational exchange is not viewed as a separate event but rather as a dynamic process evolving through successive interactions between specific partners (Poppo & Zenger 2002). Therefore, the partners decide whether to maintain an exchange relationship and anticipate outcomes based on the history of their past transactions. A premium is also placed on non-economic values such as trust, commitment and reciprocity generated by the iteration or long-term maintenance of a transaction relationship (Brown et al. 2004). Moreover, exchange parties coupled through these relational factors deeply understand each other's business, harmoniously resolve conflicts and share benefits and risks. Therefore, the difference in their strategic goals is minimised, which facilitates the successful establishment of an ITO partnership (Lee & Kim 1999).

Alternatively, researchers supporting social capital theory pay attention to the fact that particular partners may not repeatedly transact with each other or maintain long-term exchange relationships. Especially, they claim that the existence of firms related with multiple exchange parties in an ITO network is a proof that relational exchange theory is likely to be incomplete to explain the initiation and maintenance of an ITO relationship (Ravindran et al. 2009). Social capital is defined as "resources embedded in a social structure which are accessed and/or mobilized in purposive actions" and hence its concept includes "three elements intersecting structure and action: the structural embeddedness, opportunity accessibility and action-oriented use aspects" (Lin 1999, p.35). Following this conceptualisation, a body of literature addresses the values of linkages and their structures, and especially investigates relationships between network positions and a variety of significant outcomes such as "power, leadership, mobility, employment, individual performance, individual creativity, entrepreneurship and team performance" (Borgatti & Foster 2003). A (potential) partner's network position represents its reputation which is an indicator of past performance and a predictor of future behaviour (Gopal et al. 2003). It is also shown that this valuable information can be gained through the observation of a network position or the information transmission via an indirect tie with little cost (Ravindran et al. 2009). Therefore, a firm can collect information on multiple alternative candidates, have an opportunity to compare them and flexibly respond to a given business opportunity by transacting with a more suitable partner. In fact, it is reported that project managers place a premium on reputation rather than cost and consider important the role of a third party to find a competent partner in uncertain situations (Drath & Wayman 2010; Gopal et al. 2003). Moreover, a firm's reputation is regarded as a collective measure of reliability rooted in the evaluation of counterparties and an intangible asset (Jøsang et al. 2007). A firm would therefore refrain from behaving opportunistically because the damage of its reputation caused by this behaviour is the loss of its capital (Kandori 1992).

Based on these theoretical backgrounds, a body of literature has deeply investigated the roles of relational and structural embeddedness in the context of ITO. However, each ITO research stream has mainly focused on its own advantages as revealed in the literature regarding ITO partnerships (Lee & Kim 1999; Flemming & Low 2007) or ITO networks' structural properties (Ravindran et al 2009; Drath & Wayman 2010). There are several studies on the comparison between the two types of embeddedness in other research contexts and they could provide partial answers to our research question (Podolny 1994; Gulati 1995; DiMaggio & Louch 1998; Beckman et al. 2004). However, these studies do not compare relational and structural embeddedness at the different levels of measurement difficulty and requirement unpredictability imposed on the ITO business environments. Furthermore, it is mainly emphasised which of them is preferred at the high level of uncertainty rather than which of them leads to better performance according to the type and level of uncertainty. Therefore, there is a paucity of literature on the conditional superiority of each type of embeddedness at the different levels of the two uncertainties in the research area of ITO.

3 SIMULATION

3.1 Model

We model the dynamics of a virtual ITO network where vendors build consortia to respond to given outsourcing opportunities with the various levels of requirement unpredictability and measurement difficulty. In the simulation model, vendors can perform the role of either a coordinator or partner in establishing ITO consortia. As a coordinator, vendors take the partner selection and control strategy based on relational or the structural embeddedness, which is called the relational or structural strategy in this paper. A coordinator taking the relational strategy attempts to select a partner who participated in several ITO consortia together in the past. They are strongly and directly coupled through prior working experience and the tie strength between them is higher. In this case, the coordinator can manage the partner's behaviour with lower costs. On the other hand, a coordinator taking the structural strategy tries to choose a partner whose degree centrality is higher. The partner therefore occupies a prominent network position and is considered more competent. However, the coordinator bears the higher costs involved in controlling the partner's behaviour because they are not completely committed to each other. As a partner, vendors behave cooperatively or opportunistically. Opportunistic behaviour in the simulation manifests itself as the following two types: adverse selection and moral hazard. More specifically, an opportunistic vendor attempts to attend an ITO consortium exaggerating its current resource availability although the amount of its resources is smaller than is required (adverse selection). When selected as a partner, it may invest no resources for its own interests (moral hazard). These types may induce a coordinator to select an unqualified partner and decrease the quality of a delivered IT service.

The decision-makings and payoffs of ITO consortium members in the simulation model follow the game model developed by Shapiro and Stiglitz (1984), who shows that the repetition of transactions between a specific employer and employee can serve as a mechanism to safeguard against opportunism and improve long-term performance. However, the model may not be appropriate for the case that a coordinator taking the structural strategy selects and controls a new partner. The research of Kandori (1992) reveals that the role of repetition can be substituted with the direct observation of various labels (i.e. reputation, membership and license) or the indirect collection of this information through third parties. In addition, the author suggests that a norm (such as an opportunistic member is permanently expelled from a community) can serve as an alternative to repetition. Following the results, the simulation model assumes that a vendor can seek and transfer information on others' tendencies to behave cooperatively or opportunistically. It is also assumed that vendors share a norm such as a vendor is deprived of its further outsourcing opportunities when its opportunistic behaviour is detected. Then, a coordinator taking the structural strategy can collect information on candidates' behavioural tendencies through the information transmission via indirect ties as well as the observation of network positions. The coordinator can also punish its opportunistic partners by transferring their negative information and ruling them out of its future consortia. Therefore, the combination of the two studies enables us to analyse the decision-makings and payoffs for both cases of the relational and structural strategy in the simulation model.

The simulation proceeds as follows. Initially, the market generates an ITO business opportunity, of which the details are defined in a request-for-proposal (RFP). The RFP is notified to vendors in an ITO network. In sequence, several vendors who can cover the requirement for coordination abilities establish ITO consortia and submit their proposals to the market. When receiving the proposals, the market selects the one with the highest level of coordination abilities and awards a contract in accordance with the RFP to the winner consortium. Next, the members of the specific consortium perform their tasks. When these are completed, the coordinator delivers the IT service. The market assesses the quality of the delivered IT service and gives the payoff according to the assessment results. Finally, the coordinator allocates the payoff to the consortium partners in proportion to their contributions.

3.2 Experiment

We apply a full factorial design for efficient experiments and systematic analyses. An experimental design has two or more factors and each of them has discrete possible values, which are called levels. Also, the combinations of levels are called experimental points. Then, a full factorial experiment is conducted on all of the possible experimental points. In this research, there are two key factors related to uncertainty imposed on the ITO business environments: requirement unpredictability and measurement difficulty. In the majority of full factorial designs, a factor has two levels to examine its linear effects or three levels to investigate its nonlinear effects. Therefore, the two factors in this simulation have three levels respectively: low, mid and high. In the meantime, vendors in an ITO network are categorised into two groups according to the responses to each factor: the group using the relational strategy (group 1) and the group employing the structural strategy (group 2). Also, in order to compare the differences in the long-term outcomes of the two groups, the cumulative profit for each group is measured at the end period of the simulation. Then, we investigate the effects of the two factors on each group's long-term ITO outcomes by applying the full factorial design.

Based on this full factorial design, the following two-step simulation experiments were conducted: a basic test at the selected experimental point and a complete test at the whole experimental points. Firstly, we verified the developed simulation model through a basic setting where measurement difficulty was fixed at the high level and requirement unpredictability was fixed at the low level. A set of the other parameters were chosen that produce the simulation result which is in line with existing studies addressing relational embeddedness when it is difficult to exactly measure outcomes. Next, a complete test, based on the chosen parameter set, was conducted where the levels of the two factors were varied simultaneously. The results enabled us to compare the conditional superiority of relational or structural embeddedness in the presence of both uncertainties of which the levels are not uniform in the ITO business environments.

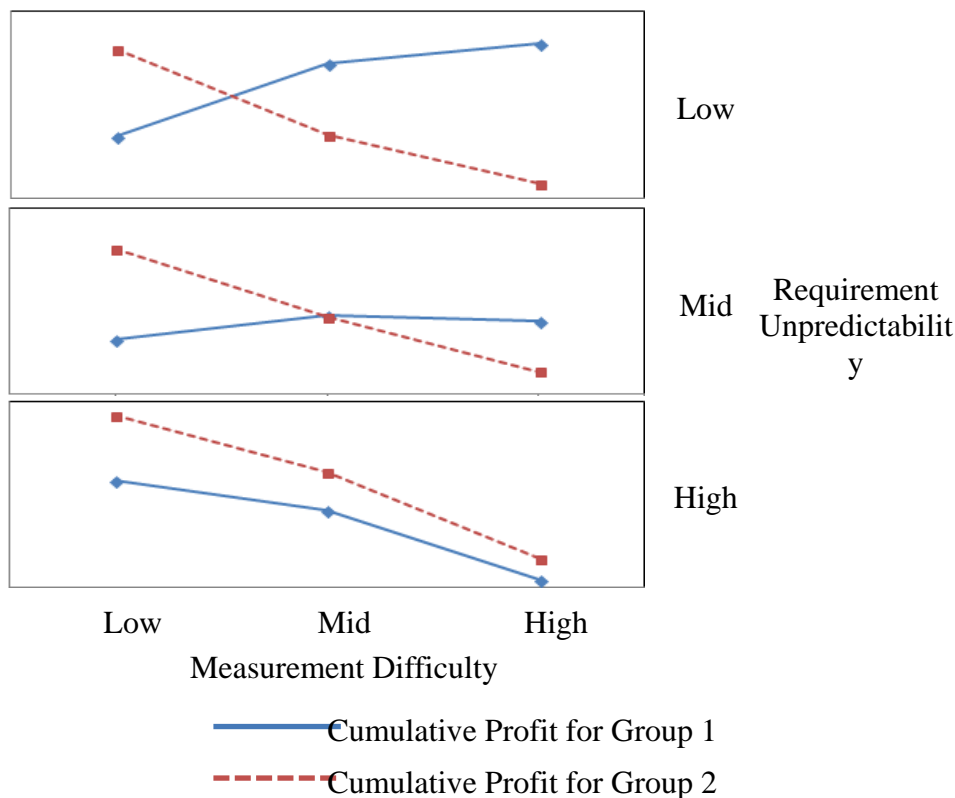


Figure 1. Cumulative profit for each group

The cumulative profit for each group is shown in Figure 1. Firstly, at the low level of requirement unpredictability, the amount of resources for a requirement increases slowly and steadily. Therefore, there is likely to be an existing partner who has enough resources to cover it for a coordinator taking

the relational strategy. Furthermore, although it is difficult to exactly measure performance, the coordinator can manage this partner with lower costs as the outsourcing parties are strongly and directly coupled through prior working experiences. In the mean time, the lower the level of measurement difficulty is, the higher the accuracy of information gained through the observation of network positions or the exchange of information via transmitters. Therefore, a coordinator using the structural strategy is likely to collect precise information on multiple candidates. Then, it can improve outcomes by selecting and controlling the most appropriate one. Secondly, at the mid level of requirement unpredictability, the cumulative profit for group 2 decreases sharply while that for the group 1 increases slowly at first and then shows a flat trend. These curve shapes are almost similar with those at the low level of requirement unpredictability. Finally, at the high level of requirement unpredictability, the amount of resources for a requirement increases fast and unstably. In this case, there may be no existing partner who has enough resources to cover it for a coordinator taking the relational strategy. Then, the coordinator unavoidably uses a competitive tender and a strict formal contract to choose and manage a new partner. However, they incur a considerable cost, which leads to the degradation of ITO outcomes. Therefore, group 2 makes better performance than group 1 throughout the level of measurement difficulty.

4 DISCUSSION AND NEXT STEP

The research on relational embeddedness emphasises trust, commitment and reciprocity generated by the repetition or long-term maintenance of a relationship between specific partners. The findings support this argument when requirement unpredictability is at the low level and measurement difficulty is at the high level. On the other hand, the literature on structural embeddedness focuses on the use of (potential) partners' network positions and transmitters. The results support this claim regardless of the level of measurement difficulty when requirement unpredictability is at the high level or when both uncertainties are at the low level.

The contributions of this paper to ITO literature are as follows. Firstly, this research examined the conditional superiority of relational or structural embeddedness at the different levels of measurement difficulty and requirement unpredictability imposed on the ITO business environments. Therefore, our study provides a better understanding of which of the two types of embeddedness leads to better performance according to the type and level of uncertainty in the context of ITO.

Secondly, this paper provides a possible answer to why ITO partnerships based on relational embeddedness are prevalent and sometimes fail in the real world. In the perspective of cost-benefit, an ITO partnership is generally perceived to be more advantageous. However, it is reported that this long-term cooperative ITO relationship does not always guarantee the success of ITO. Mike Lafford, the Group Vice President of Gartner Incorporated, advises that a long-term ITO contract may lead to a client's disadvantages and the realisation of his concern is found in the example of the State of Virginia's ITO (Park 2009). Virginia Information Technologies Agency (VITA) made a massive ITO contract with Northrop Grumman Corporation. The size and duration of this contract were approximately two billion dollars and ten years. However, the attempt to outsource the state's IT systems has proven to be a failure and the Director of VITA resigned from his position. This research can provide a possible theoretical explanation for this situation. The pace of technological change is relatively rapid and instable in the ITO business environments which may increase both measurement difficulty and requirement unpredictability. Apparently, as shown in many studies on an ITO partnership, a long-term cooperative relationship develops trust, commitment and reciprocity between a client and vendor, which reduce the need for the exact measurement of outcomes. However, the dynamic change of requirements over time may be beyond the coverage of the vendor's capability or the outsourcing parties' collaboration. In this case, the client using the relational strategy faces the problem of "overembeddedness" and cannot flexibly respond to the high level of requirement unpredictability. On the other hand, there are several examples supporting the propriety of the structural strategy in the presence of the high levels of both uncertainties. The collaborative research consortia funded by the EU FP7 ICT programme perform research projects which require various kinds of advanced technology and methods. In accordance to previous business settings, it is expected that it is difficult to measure outcomes and that requirements change rapidly and unstably. In this

case, the project managers use candidates' reputations and third parties to find right partners who are competent as well as reliable (Drath & Wayman 2010). Therefore, this research can explain under which condition the structural strategy is preferred.

Thirdly, this study also shows that the comparison between relational and structural embeddedness can be in line with the theoretical arguments on exploitation and exploration in the perspective that each of them focuses on the utilisation of present partners and the search of emergent partners. It is suggested that "the essence of exploitation is the refinement and extension of existing competencies, technologies and paradigms" and "the essence of exploration is experimentation with new, uncertain alternatives" (March 1991). Exploration and exploitation compete with each other due to scarce resources and hence the amount of resources allocated to either of them is different in accordance with an environment which a firm faces (March 1991). Our key claims can extend the general argument that a firm should invest more resources in exploration than in exploitation in an uncertain environment (Lant et al. 1992). In this study, it is shown that the type and level of uncertainty determine the conditional superiority of relational or structural embeddedness. Therefore, the results imply that a firm's unconditional investment in exploration in response to uncertainty may lead to its failure.

In practical perspective, the investigation on the conditional advantage of each type of embeddedness provides ITO managers with a guideline for a choice between the relational and structural strategy. At first, a firm should consider whether requirements change rapidly and unstably. If so, the structural strategy is more recommended than the relational strategy because there may be no existing partner who can satisfy them. Otherwise, the firm should consider the following question: is it possible to exactly measure ITO performance? If the answer is yes, the structural strategy is recommended again since the correctness of information gained through network positions or transmitters is high. However, if the level of measurement difficulty is high, the relational strategy is recommended as the need for the exact measurement of ITO outcomes is reduced between relationally embedded ITO parties.

The work is still in progress. In this study, the cumulative profit is used to compare the conditional superiority of each type of embeddedness. The hidden cost of managing a partner can be also used as another comparative criterion for ITO performance. Therefore, we will analyse the hidden cost for each group. The future research direction of this study is to generalise the findings in this study against different IT outsourcing configurations. For example, recently IT outsourcing through cloud service platforms are getting more common in private and public sector. For example, OASIS project (OASIS, 2013) is an example of an innovative IT outsourcing mechanisms in public sector that allows public agencies (clients) can make purchases of public services on a cloud computing platform in which case the IT network takes start-shape through suppliers and this specialized network configuration may make different impacts on the findings in this paper.

Acknowledgement

This study was partially supported by EU FP7 project OASIS (297210).

References

- Aubert, B.A., Patry, M. and Rivard, S. (1998). Assessing the risk of IT outsourcing. In Proceedings of the 31st Annual Hawaii International Conference on System Sciences (Watson, H. Ed.), p. 685, Vol. 6, Hawaii.
- Beckman, C.M., Haunschild, P.R. and Phillips, D.J. (2004). Friends or strangers? firm-specific uncertainty, market uncertainty, and network partner selection, *Organization Science*, 15 (3), 259-275.
- Borgatti, S.P. and Foster, P.C. (2003). The network paradigm in organizational research: A review and typology. *Journal of Management*, 29 (6), 991-1013.
- Brown, M., Falk, A. and Fehr, E. (2004). Relational contracts and the nature of market interactions. *Econometrica*, 72 (3), 747-780.

- DiMaggio, P. and Louch, H. (1998). Socially embedded consumer transactions: For what kinds of purchases do people most often use networks? *American Sociological Review*, 63 (5), 619-637.
- Drath, P. and Wayman, S. (2010). How research project co-ordinators choose partners for ICT proposals (report for a survey). Document D5.6.1, Ideal-ist.
- Flemming, R. and Low, G. (2007). Information systems outsourcing relationship model. *Australasian Journal of Information Systems*, 14 (2), 95-112.
- Gopal, A., Sivaramakrishnan, K., Krishnan, M.S. and Mukhopadhyay, T. (2003). Contracts in offshore software development: An empirical analysis. *Management Science*, 49 (12), 1671-1683.
- Gulati, R. (1995). Social structure and alliance formation patterns: A longitudinal analysis. *Administrative Science Quarterly*, 40 (4), 619-652.
- Jøsang, A., Ismail, R. and Boyd, C. (2007). A survey of trust and reputation systems for online service provision. *Decision Support Systems*, 43 (2), 618-644.
- Kandori, M. (1992). Social norms and community enforcement. *Review of Economic Studies*, 59 (1), 63-80.
- Kim, S. and Chung, Y.-S. (2003). Critical success factors for is outsourcing implementation from an interorganizational relationship perspective. *Journal of Computer Information Systems*, 43 (4), 81-90.
- Lacity, M.C., Khan, S., Yan, A. and Willcocks, L.P. (2010). A review of the it outsourcing empirical literature and future research directions. *Journal of Information Technology*, 25 (4), 395-433.
- Lant, T.K., Milliken, F.J. and Batra, B. (1992). The role of managerial learning and interpretation in strategic persistence and reorientation: An empirical exploration. *Strategic Management Journal*, 13 (8), 585-608.
- Lee, J.-N. and Kim, Y.-G. (1999). Effect of partnership quality on is outsourcing: Conceptual framework and empirical validation. *Journal of Management Information Systems*, 15 (4), 29-61.
- Lin, N. (1999). Building a network theory of social capital. *Connections*, 22 (1), 28-51.
- March, J.G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2 (1), 71-87.
- Nahapiet, J. and Ghoshal, S. (1998). Social capital, intellectual capital, and the organizational advantage. *Academy of Management Review*, 23 (2), 242-266.
- OASIS (2013). Openly accessible services and interacting society. EU FP7 CIP Pilot action, Grant number 297210. <http://www.oasis-eu.org/>.
- Park, H. (2009). Reasons for IT outsourcing failures. *The Electronics Times*. Retrieved from http://www.etnews.com/news/special/2191439_1525.html
- Podolny, J.M. (1994). Market uncertainty and the social character of economic exchange. *Administrative Science Quarterly*, 39 (3), 458-483.
- Poppo, L. and Zenger, T. (2002). Do formal contracts and relational governance function as substitutes or complements? *Strategic Management Journal*, 23 (8), 707-725.
- Ravindran, K., Susarla, A. and Gurbaxani, V. (2009). Social network and contract enforcement in IT outsourcing. In *Proceedings of the 30th International Conference on Information Systems*, Paper 143, Phoenix.
- Ring, P.S. and Van de Ven, A.H. (1992). Structuring cooperative relationships between organizations. *Strategic Management Journal*, 13 (7), 483-498.
- Robertson, T.S. and Gatignon, H. (1998). Technology development mode: A transaction cost conceptualization. *Strategic Management Journal*, 19 (6), 515-531.
- Shapiro, C. and Stiglitz, J.E. (1984). Equilibrium unemployment as a worker discipline device. *American Economic Review*, 74 (3), 433-444.